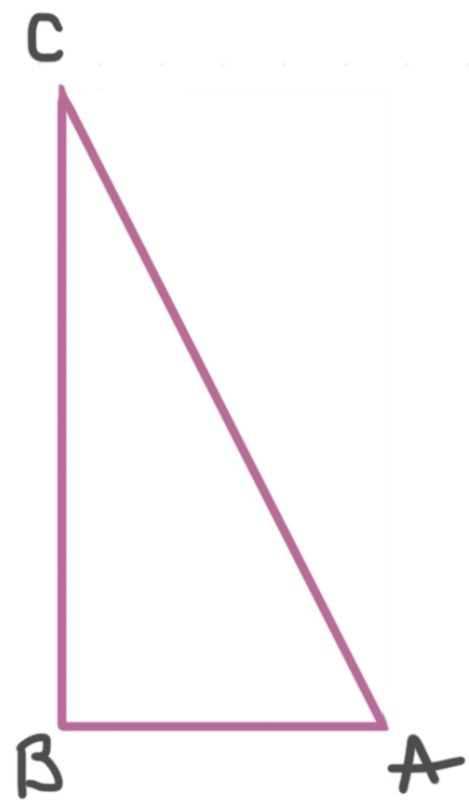
CPCTC

CPCTC stands for “corresponding parts of congruent triangles are congruent.”

In the previous sections, we’ve used congruent parts of a pair of triangles to try to prove that the triangles themselves are congruent. CPCTC flips this around, and makes the point that, given two congruent triangles, then we know that corresponding pieces of those triangles must also be congruent.

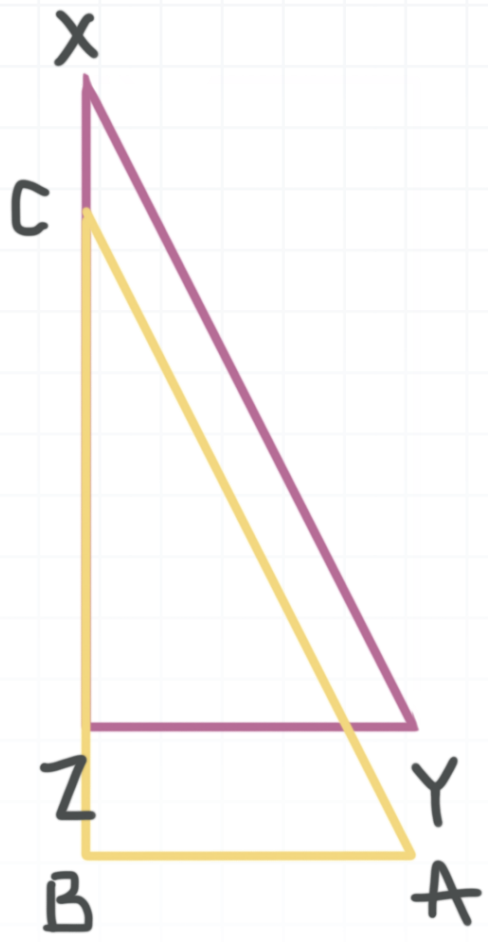
In other words, all of the corresponding sides and angles are congruent to one another. Remember that when you name a pair of congruent triangles, you need to name them with their corresponding parts in the same order.

For example, if you know the two triangles below are congruent, you need to match up the corresponding angles and sides.



© Krista King Math

These two triangles are congruent to each other and match in this way:



Now that the sides are matched up, you can name the corresponding angle pairs.

$$\angle A \cong \angle Y$$

$$\angle B \cong \angle Z$$

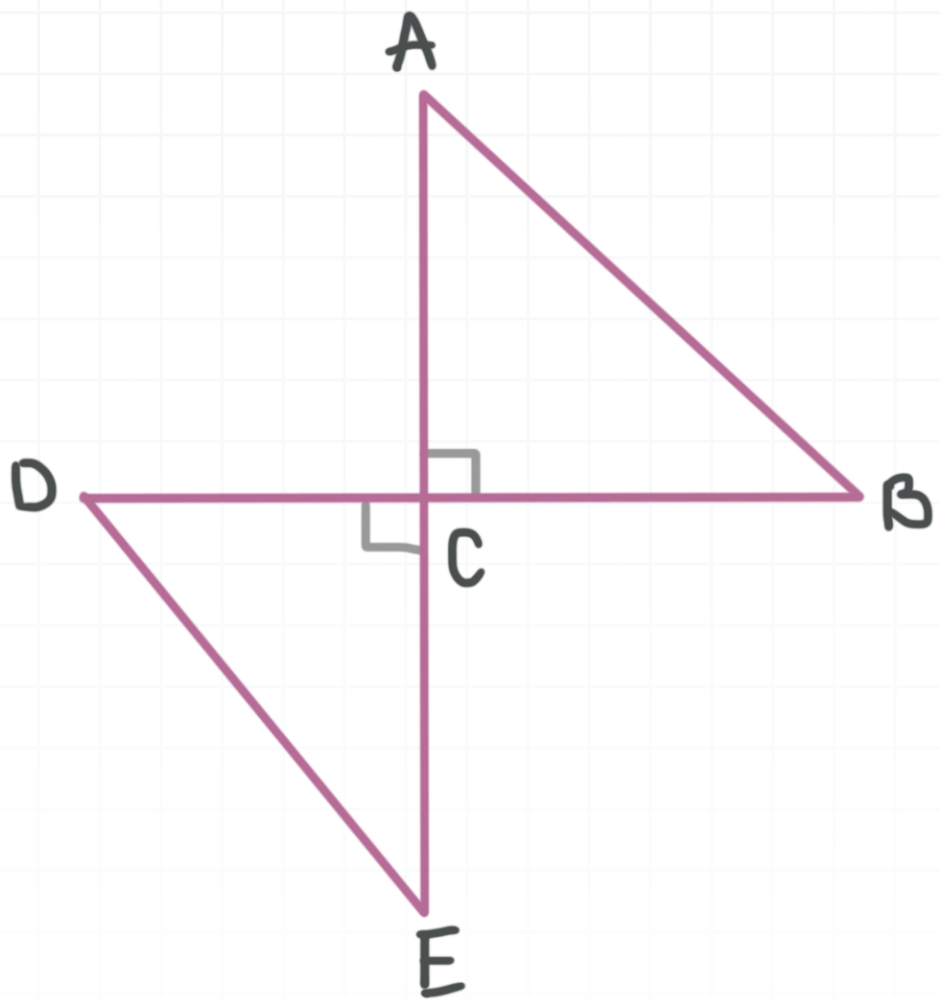
$$\angle C \cong \angle X$$

Now we name the congruent triangles so that the corresponding angles match up in the congruency statement.

$$\triangle ABC \cong \triangle YZX$$

This would also work if you were given the congruency statement. For instance, say we're given $\triangle CED \cong \triangle CAB$,

© Krista King Math



Then from this statement alone (even if we didn't have the diagram) we could write our congruency statements and match up the corresponding sides and angles. This statement tells us that

$$\triangle CED \cong \triangle CAB$$

$$\angle C \cong \angle C$$

$$\angle E \cong \angle A$$

$$\angle D \cong \angle B$$

We can also match up the congruent sides:

$$\triangle CED \cong \triangle CAB$$

$$\overline{CE} \cong \overline{CA}$$

© Krista King Math

$\overline{ED} \cong \overline{AB}$

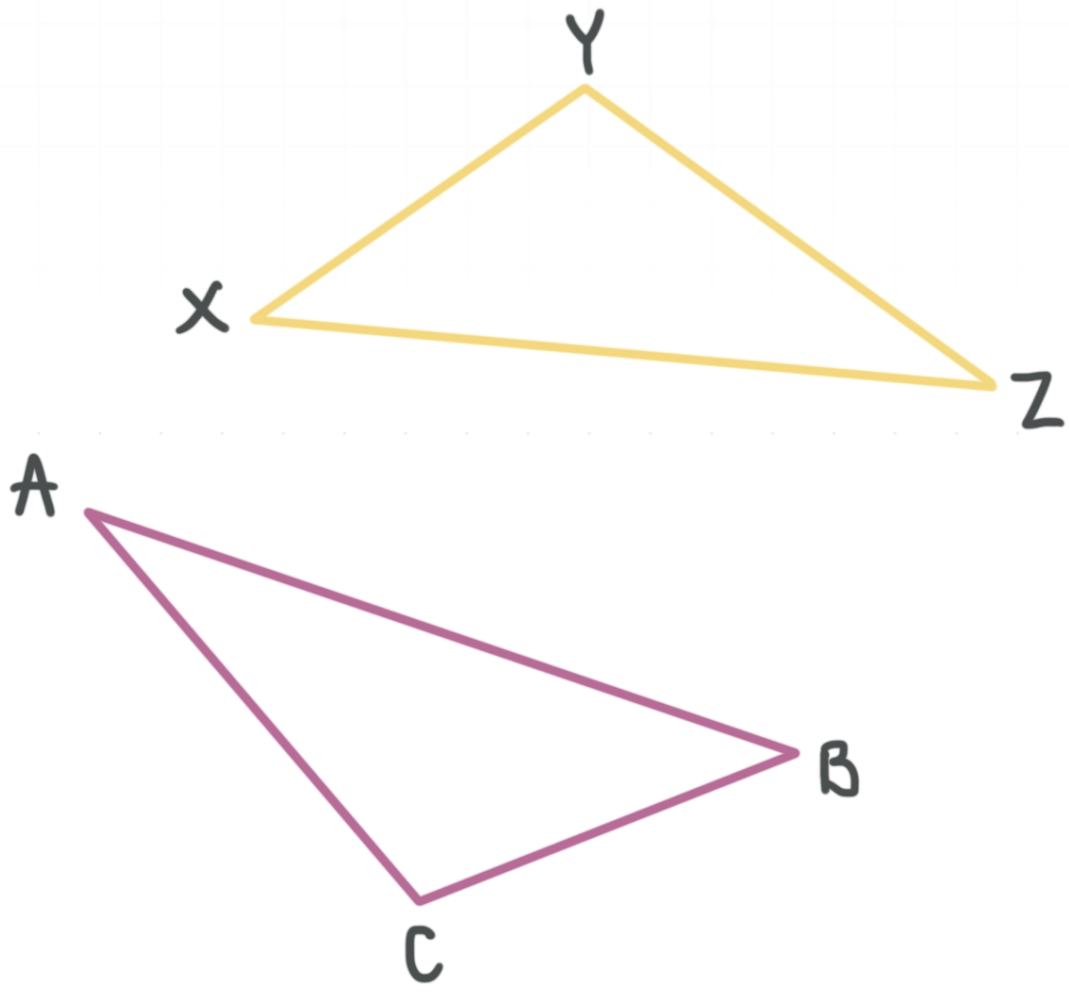
$\overline{DC} \cong \overline{BC}$

All you need to do is make sure you're matching in the same order as in the congruency statement. If you focus on that, then you can't go wrong.

Let's start by working through an example.

Example

Complete the congruency statement by naming the corresponding angle to $\angle XZY$, given that $\triangle ABC \cong \triangle ZXY$.



We know that $\triangle ABC \cong \triangle ZXY$, so the corresponding angle pairs are

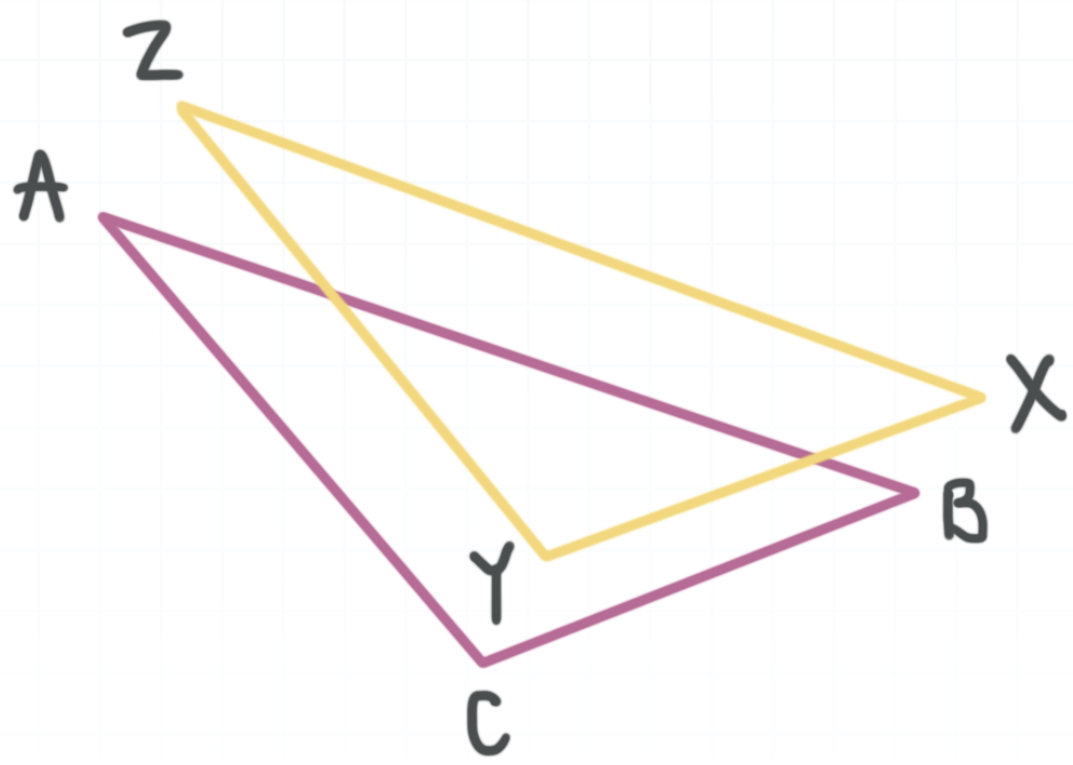
© Krista King Math

$\angle A \cong \angle Z$

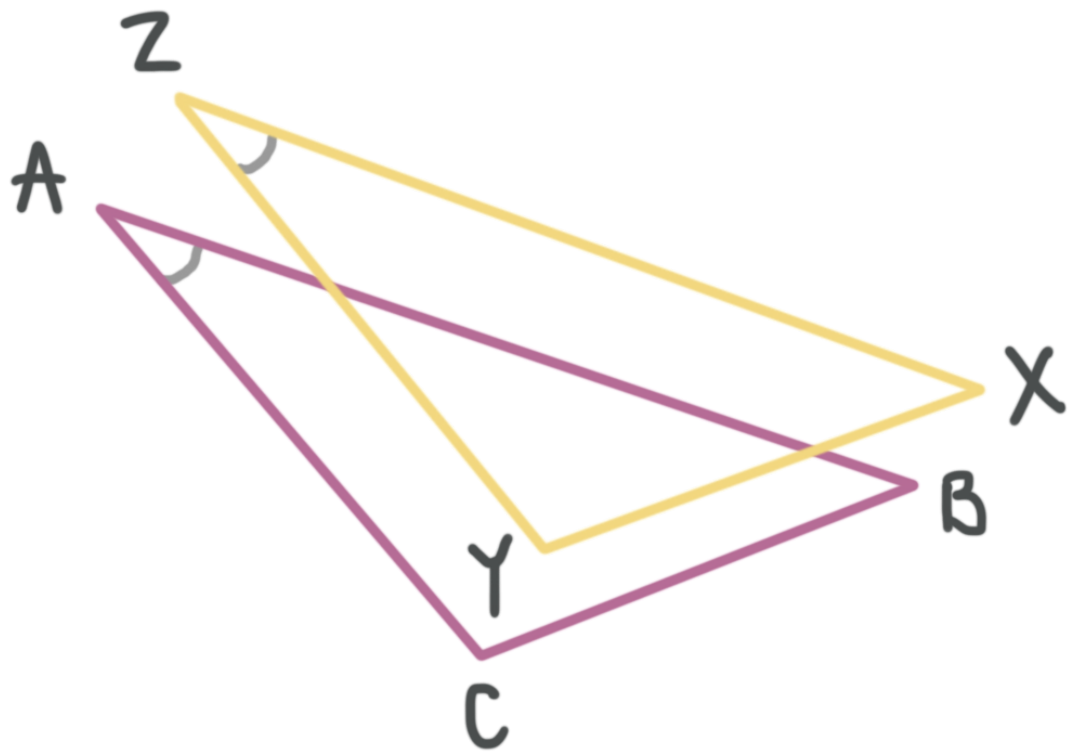
$\angle B \cong \angle X$

$\angle C \cong \angle Y$

The triangles match like this:



Now we can find the corresponding angle to $\angle XZY$.



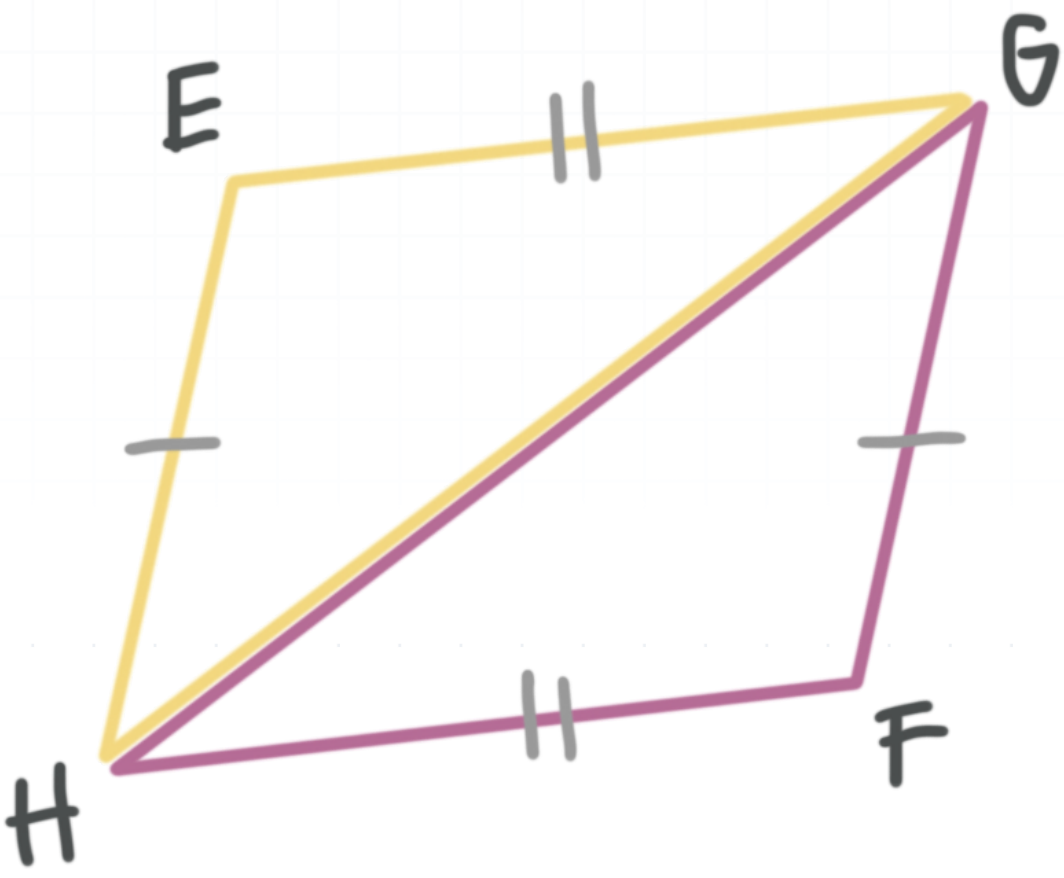
© Krista King Math

The congruency statement between those angles is then $\angle XZY \cong \angle BAC$.

Let's try another example.

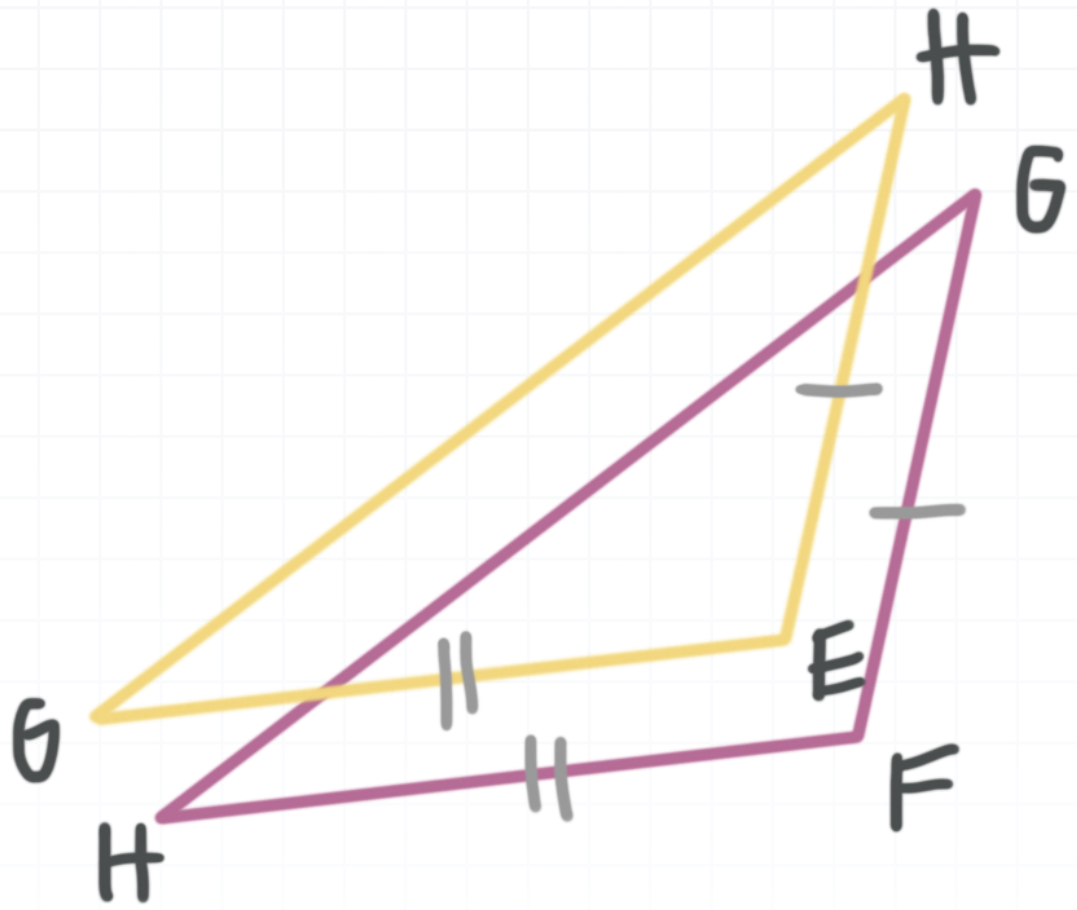
Example

These two triangles are congruent by side, side, side. Write the congruency statement for the triangles.



Match up the corresponding parts.

© Krista King Math



The congruent angle pairs are

$\angle E \cong \angle F$

$\angle G \cong \angle H$

$\angle H \cong \angle G$

From the matched up angle, we can write any of these congruency statements:

$\triangle EGH \cong \triangle FHG$

$\triangle GHE \cong \triangle HGF$

$\triangle HEG \cong \triangle GFH$

© Krista King Math

As you can see, there's more than one correct way to write the statement. As long as the corresponding parts match up, the congruency statement is correct.

© Krista King Math